

**Red Flag Analysis Tool and Engineer's Estimate Review
Training and Transition Plan
July 27, 2006 Version**

Background:

Engineering Services was assigned the responsibility to review engineer's estimates prior to advertisement from the regions during the volatile bidding period of late 2005 and early 2006. Engineering Services developed the Red Flag Analysis to account for project characteristics which affect project cost. This tool is now available to the regions to assist them in project cost estimating and review of their engineer's estimates prior to advertisement.

Goals:

1. Transition the responsibility of reviewing engineer's estimates prior to advertisement to the regions.
2. Assist the regions in anticipating project costs early in the design process by using the Red Flag Analysis estimating tool or another estimate review quality control process of the Region's choice.
3. Provide Red Flag Analysis tool to regions for use in annually updating project estimates for all projects in STIP to ensure correct funding allocation.

Meet with Regions and Present Transition Options

- Meet with the region Project Managers and Project Design Engineers to discuss how the region can implement an engineer's estimate review program. The options include:
 - Option 1: Regions assume responsibility for engineer's estimate review (see below).
 - Option 2: Project Development continues reviewing engineer's estimates using a contract employee (see below).
 - Other options as suggested by the region.

Option 1: Transition Engineers Estimate Review to Regions

The region benefits from this option because the region remains in complete control of their program. In addition, the region will realize benefits in schedule, budget, scoping, and quality of their projects as they implement an engineer's estimate review program.

Recommended Steps:

- Engineering Services to provide Red Flag Analysis program to region Project Managers and Project Engineers (PDBS and/or Access version).

- Region will evaluate if they want to use the Red Flag Analysis estimating tool or another estimate review quality control process of the Region's choice. The region will develop a formal written estimate review quality control process if they desire to customize the estimate review process.
- Region will select person(s) who will review all the region's engineer's estimates prior to advertisement (encompasses review of UDOT and consultant prepared estimates). These individuals will QC the estimate after it is compiled by the originator. (*QC or Quality Control = provide an independent check per UDOT QC/QA criteria*).
- Steve Anderson and Jason Henrie will provide the following:
 - Red Flag Analysis training to UDOT personnel (including informal follow up training as necessary).
 - Condensed handout describing the fundamental aspects of the Red Flag Analysis tool.
- Recommend that the region Program Manager:
 - Act as an "escalation" resource (if necessary) if the originator and the QC individual are unable to come to an agreement on project costs.
 - Assist project managers to locate funding, delay, or forgo projects which are short of funding.
 - Perform the QA function of the estimate review. (*QA or Quality Assurance = Assure that the quality control was completed per UDOT QC/QA plan criteria*).
- Recommend every project have a Concept Report with a Concept Report cost estimate.
- Implement Red Flag Analysis/estimate review at:
 - Concept
 - Plan-in-Hand
 - PS&E
 - Advertising
- Recommended estimate review transitional period:
 - Region and Engineering Services will do side-by-side review for 5 projects at advertising.
 - Concurrence of both Region and Engineering Services will be necessary during this 5 project side-by side period for projects to advertise.
 - Region Program Manager and Engineering Services will meet after 5 project side-by-side period and will recommend one of the following:

- Complete transition of estimate review responsibilities to region.
 - Additional side by side reviews.
- Finalize transition of engineer's estimate review to region:
 - Region formally accepts responsibility of reviewing engineer's estimates.
 - Engineering Services will send a formal email to the region to mark the official change in business practice.
 - Marjorie Sanchez will only advertise projects that have an estimate QC/QA sign off form (to comply with a potential revision to the advertising checklist – see appendix).
 - Region will independently monitor plan holders during bidding and adjust estimates as necessary.
 - Regions will monitor project estimates between estimate approval and bid opening. (Generally this is unnecessary if projects are bid quickly, however some projects need this as the market changes while they wait to be advertised.)
 - Engineering Services will offer additional support and training as necessary to support the region and help the region be successful in this endeavor.
 - Regions will prepare lessons learned on projects after bid opening and forward lessons learned to Engineering Services for posting on the inner-web.

Option 2: Contract Employee to Continue Engineer's Estimate Review

- Responsibility to independently review and approve engineer's estimates remains at the complex at the region's request.
- Steve Anderson and Jason Henrie will provide the following:
 - Red Flag Analysis training to Project Managers and Project Engineers.
 - Condensed manual describing the fundamental aspects of the Red Flag Analysis tool.
- Region will perform the following project Red Flag Analysis/estimate reviews:
 - Concept level (recommended).
 - Plan-in-Hand (recommended).
- Contract employee will perform the following:
 - PS&E level engineer's estimate review.

- Advertising level engineer's estimate review and approval.
 - Monitor plan holders during bidding.
 - Prepare lessons learned from project after bid opening.
- (Contract employee time charges will be charged at contract employee billing rates to the individual projects requesting the reviews. Project development personnel time to administer the contract employee will also be charged to projects requesting the reviews.)***
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Appendix

Other Items to be Addressed to Support/Enhance the Transition Plan

Engineering Services Continuing Responsibilities

- Oversee Red Flag Analysis Tool:
 - Monitor materials and oil costs
 - Monitor bidding climate
 - Obtain contractor feedback after they bid on projects
 - Update and calibrate Red Flag Analysis as necessary
 - Respond to feedback from Regions
 - Keep user's manual updated

(Note: regions may adapt Red Flag Analysis tool to meet local needs.)
- Update inner-web with:
 - Lessons learned on projects after bid opening
 - Any current cost estimating tools or information

(Note: regions may adapt Red Flag Analysis tool to meet local needs.)
- UDOT Engineer's conference – session on Red Flag Analysis tool
 - UDOT personnel
 - Consultants
- Estimate training by consultant.
- Support the regions to be successful in estimating costs on projects.
- Support the long term outlook – Regions will retain all accountability for scope, schedule, and budget including engineer's estimate review.
- Develop brief estimate preparation handbook for publication on the internet.

- Training - Get word out to all (UDOT, consultants, etc) on Red Flag analysis. So the project characteristics affecting project cost can be identified during project scoping.

Conceptual Issues for Consideration:

- Update advertising checklist to address Red Flag analysis review – attach a hard copy of sign off form saying who originated, QC, and QA.
- Update advertising checklist to include project QC/QA sign off.
- Have Red Flags be addressed in a “bid item contingency” that shows up in the estimate, but doesn’t get bid on by contractors.
- Train consultants at the complex on the Red Flag analysis – arrange 2-3 sessions of 1-2 hours each. Could also train consultants at regions – it would probably pay for itself to get consultants informed sooner rather than later. Let the consultants know that training will also be available at UDOT conference.
- Allow the use of quantity filters on PDBS statewide average comparison report.